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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,316	09/26/2003	Koji Kobayashi		5336

7590 02/08/2007  
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EXAMINER
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LEWIS, BEN

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/08/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/670,316

Applicant(s)

KOBAYASHI ET AL.

Examiner

Ben Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                               | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                      | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 10<sup>th</sup>, 2007 has been entered. Claims 1 and 3 have been amended. Claims 7-21 have been cancelled. Claim 22 has been added.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The definitions and locations of the terms "wherein the pressure regulating means includes two regulating valves that are arranged in parallel"

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are not disclosed in the instant specification. If applicant believes said terms are fully defined, it is requested that applicant indicates column and line, and/or figure with number, identifying the support for suspending a stack.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-6 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang (U.S. Pub. No. 2003/0035986 A1).

With respect to claims 1-3, Yang discloses a diaphragm pump and anode stream recirculation system using such pump for a fuel cell wherein the anode gas flows through a switch **62** and a pressure regulating device **64** before entering the fuel cell **80** through an anode gas input **82**. The switch **62** can be a solenoid valve which is used to control the open/close of the gas flow in the piping and to determine whether fresh anode gas should be released from the anode gas supply **60**. The pressure regulating

device **64** is used to adjust the pressure of the anode gas flowing therethrough. Generally, the flowing amount of the anode gas is set to be higher than the required Stoichiometric amount for a specific electrical power generation of the fuel cell so as to ensure that the electrochemical reaction takes place completely within the fuel cell **80** (Paragraph 0024).

With respect to a sensor for detecting the concentration of the fuel gas in the fuel chamber, Yang teach that two sensors **106** and **108** sense the position of the piston **90** by the magnet **110** thereon. The flowing rate and the pressure of the anode gas supply **60** are set to be higher than the required Stoichiometric amount for a specific electrical power generation of the fuel cell **80** so as to ensure that the electrochemical reaction takes place completely within the fuel cell **80**.

With respect to control means for controlling the pressure regulating valve responsive to the detected concentration of the fuel gas in the fuel chamber, Yang teach that when the switch **62** "valve" is switched on, the anode gas from the anode gas supply **60** with significantly higher pressure will thrust into the whole system, the pressure of the portion **102** thus increases and thereby moves the piston **90** downwardly and compresses the spring **94**. When the piston **90** downwardly moves to a predetermined position, the sensor **108** senses the position of the approaching magnet **110** on the piston **90** and transmits a signal to switch off the switch **62**. At this time, no more fresh anode gas is supplied (Paragraph 0026).

With respect to the pressure regulating means including two regulating valves that are arranged in parallel, Yang teach that the anode gas flows through a switch **62**

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and a pressure regulating device **64** before entering the fuel cell **80** through an anode gas input **82**. The switch **62** can be a solenoid valve which is used to control the open/close of the gas flow in the piping and to determine whether fresh anode gas should be released from the anode gas supply **60** (Paragraph 0024).

With respect to a fuel discharge line connected to the fuel chamber and a discharge valve in the fuel gas discharge line, Yang teach that the anode stream recirculation system further comprises two check valves **72** and **74** "discharge valves in fuel gas discharge line" with one provided between the anode gas input **82** of the fuel cell **80** and the diaphragm pump **70**, and the other provided between the anode gas output **84** of the fuel cell **80** and the diaphragm pump **70**. In this preferred embodiment, the check valves **72** and **74** are mounted on the two sides of the diaphragm pump **70** (Paragraph 0024).

With respect to claim 4, It is well known in the fuel cell art that fuel cells are connected to an external load in the normal power generation state as evidenced by Merritt et al. (U.S. Patent No. 5,366,821 Col 7 lines 10-20).

With respect to claims 5-6, Yang discloses a diaphragm pump and anode stream recirculation system using such pump for a fuel cell wherein the anode gas flows

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through a switch **62** and a pressure regulating device **64** before entering the fuel cell **80** through an anode gas input **82**. The switch **62** can be a solenoid valve which is used to control the open/close of the gas flow in the piping and to determine whether fresh anode gas should be released from the anode gas supply **60**. The pressure regulating device **64** is used to adjust the pressure of the anode gas flowing therethrough. The instant specification recites that it is preferred that the fuel cell system of the present invention further comprises a start switch for turning on and off of the fuel cell system wherein the power generation startup time of the fuel cell includes a predetermined period of time after the start switch is turned on (Paragraph 0014).

Yang et al does not specifically teach wherein the fuel cell system comprises a start switch and wherein the power generation start-up time of the fuel cell includes a predetermined period of time after the start switch is turned on. However, it is the position of the examiner that such functions are inherent, given that Yang et al and the present application utilize the same pressure regulating system and the fuel cell of Yang would take a period of time after the reactive gasses are charged into the system to generate power. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claim 22, Yang teach that a fuel discharge line connected to the fuel chamber and a discharge valve in the fuel gas discharge line, Yang teach that the anode stream recirculation system further comprises two check valves **72** and **74**

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"discharge valves in fuel gas discharge line" with one provided between the anode gas input **82** of the fuel cell **80** and the diaphragm pump **70**, and the other provided between the anode gas output **84** of the fuel cell **80** and the diaphragm pump **70**. In this preferred embodiment, the check valves **72** and **74** are mounted on the two sides of the diaphragm pump **70** (Paragraph 0024).

### ***Response to Arguments***

5. Applicant's arguments filed on January 10<sup>th</sup>, 2007 have been fully considered but they are not persuasive.

*Applicant's principle arguments are*

(a) Yang neither discloses nor suggests anything equivalent to the gas discharge line now recited by claim 1. Further, Yang neither discloses nor suggests a pump in the fuel gas discharge line as recited by newly added claim 22.

(b) Yang neither discloses nor suggests "pressure regulating means" for regulating the pressure of the flow of fuel gas into the fuel cell at one pressure upon startup and at a different pressure for later, normal operation in power generation.

(c) Neither of position sensors 106 and 108 of Yang can properly be considered "a sensor for detecting the concentration of the fuel gas in the fuel chamber. Position



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sensors are not gas sensors. Further, even if 106 and 108 did function to detect concentration of some gas they could not detect "the concentration of the of the fuel gas in the fuel chamber" because they are remote from the fuel chamber with intervening valving.

(d) The examiner reads claim 3 on valves 62 and 64 of Yang. However, valves 62 and 64 of Yang are clearly in series, not in parallel as required by claim 3. Further 62 is an ON/OFF switch and placing it in parallel with 64 would allow gas to bypass pressure regulation by valve 64, contrary to the teaching of Yang.

In response to Applicant's arguments, please consider the following comments.

(a) Yang teach that a fuel discharge line connected to the fuel chamber and a discharge valve in the fuel gas discharge line, Yang teach that the anode stream recirculation system further comprises two check valves **72** and **74** "discharge valves in fuel gas discharge line" with one provided between the anode gas input **82** of the fuel cell **80** and the diaphragm pump **70**, and the other provided between the anode gas output **84** of the fuel cell **80** and the diaphragm pump **70** "pump in discharge line". In this preferred embodiment, the check valves **72** and **74** are mounted on the two sides of the diaphragm pump **70** (Paragraph 0024).

(b) Yang discloses a diaphragm pump and anode stream recirculation system using such pump for a fuel cell wherein the anode gas flows through a switch **62** and a pressure regulating device **64** before entering the fuel cell **80** through an anode gas input **82**. The switch **62** can be a solenoid valve which is used to control the open/close of the gas flow in the piping and to determine whether fresh anode gas should be released from the anode gas supply **60**. The pressure regulating device **64** is used to adjust the pressure of the anode gas flowing therethrough. Generally, the flowing amount of the anode gas is set to be higher than the required Stoichiometric amount for a specific electrical power generation of the fuel cell so as to ensure that the electrochemical reaction takes place completely within the fuel cell **80** (Paragraph 0024).

(c) Yang teach that when the switch **62** "valve" is switched on, the anode gas from the anode gas supply **60** with significantly higher pressure will thrust into the whole system, the pressure of the portion **102** thus increases and thereby moves the piston **90** downwardly and compresses the spring **94**. When the piston **90** downwardly moves to a predetermined position, the sensor **108** senses the position of the approaching magnet **110** on the piston **90** and transmits a signal to switch off the switch **62**. At this time, no more fresh anode gas is supplied (Paragraph 0026). "Since the pressure of hydrogen gas in a containment is directly related to its concentration in that containment then a device which is capable of sensing the pressure of hydrogen gas in a containment is also capable of sensing its concentration in that containment."

(d) The definitions and locations of the terms "wherein the pressure regulating means includes two regulating valves that are arranged in parallel" are not disclosed in the instant specification. If applicant believes said terms are fully defined, it is requested that applicant indicates column and line, and/or figure with number, identifying the support for suspending a stack.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


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Ben Lewis

Patent Examiner  
Art Unit 1745

  
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SUPERVISOR